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ON THE EFFECTS OF THE EXPANSION OF REGIONAL ARRANGEMENTS: AN INTRA-INDUSTRY TRADE MODEL

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Abstract

This paper uses a differentiated-good model to study the welfare effects of Regional Integration Arrangements (RIAs). It shows, on the one hand, that an expansion of a regional grouping always unambiguously hurt those that are left out even if the external tariffs of the RIA remain constant. On the other hand, the effects of an expansion on a member country's welfare is positive for small RIA size but becomes negative as the RIA becomes large.

1. Introduction

The recent revival of regionalism around the world has revived concerns about the

compatibility of regional integration arrangements (RIA) with the goal of multilateral

trade liberalization. Although many policymakers have championed the possibility of a

benign regionalism, in academic circles, many economists question whether RIAs will

eventually lead to broader liberalization. The literature on what Bhagwati (1993) called

the "dynamic" time path issue focuses on two questions distinguished in Bhagwati and

Panagariya (1996). First, assuming that the time-path of multilateral trade negotiations

(MTN) and the time-path of RIAs interact, will undertaking the RIA path have a benign

or a malign effect on the MTN time path? Second, assuming instead that the two time

paths (MTN and RIA) are separable and do not influence each other, will the RIA time-

path be characterized by stagnant or by expanding membership?

While a large number of papers (e.g., Panagariya and Findlay (1994), Krishna

(1996), Cadot, de Melo and Olarreaga (1996, 1997), Levy (1997), Bagwell and Staiger

(1997), Wei and Frankel (1996)) have attempted to answer the first question, the

literature on the second question is much smaller. Papers by Yi (1996) and Bond and

Syropoulos (1996) belong to this category. Closer to the present paper, Baldwin (1993)

uses an extension of Grossman and Helpman (1995) and concentrates on the incentives of

nonmembers to join the RIA. He argues that recent spread of regionalism is caused by

two idiosyncratic events (namely, NAFTA and the EC's 1992 programme) multiplied by

a domino effect. He demonstrates that the RIA will create a domino effect in that the

incentive of outsiders to apply for membership increases as the number of insiders rises.

The result is a continuous expansion of the RIA that will stop only when all the remaining outsiders have high enough objection to becoming members. Baldwin's model is insightful but it deals only with half of the problem as it fails to formalize the incentive of members to accept or reject new members.

This paper complements that of Baldwin in that, instead of concentrating only on the incentives of the nonmembers to form, to join or to expand an RIA, it also looks at those of the members. In particular, it asks whether an RIA will be characterized by stagnant or by expanding membership. In the process of doing so, I derive the effects of the creation or the expansion of an RIA on both the members and those that are left out.

In the section 2, I discuss the intuitive structure of the formal model and argue that entry conditions matter. My approach is general and can easily be applied to different models. In section 3, I present the formal model and define notations. In section 4, I extend the model to take regional integration into account and define the equilibrium conditions. In section 5, I investigate and decompose the effects of the creation or expansion of a RIA on members and non-members. The main finding is that the outsiders are unambiguously hurt by the expansion while the effects on the members vary according to the group size. In section 6, I describe the mechanics behind the expansion of a RIA and discuss the equilibrium. I find that, while the club could continuously grow under free (or open) membership condition, under selective membership the RIA fails to grow all the way to global free trade. I argue that this model can explain the observed waves of regionalism. Section 7 concludes.

2. <u>The Logic</u>

It is helpful to look at the different actors participating in the RIA formation and expansion processes. Since it takes more than one sides to form or to expand a RIA, the issue has to be addressed by taking account of both the current union members (or the "insiders") and the non-members (or the "outsiders"). For a RIA to exist or to expand, there needs to be a "double (or even multiple) coincidence of wants."[1]

Up to what point would the insiders accept new members? Under what circumstances would outsiders apply for membership? What would be the resulting club size? To deal with these types of question, it is useful to consider the options available to the two types of countries (insiders and outsiders). I first look at the insiders and then at the outsiders.

First, insiders could accept or solicit (freely or with side payment) new members. Exporters in a member country might support the entry of new members in order to take advantage of the larger preferential market. New entry could also mean higher market and bargaining power for the member countries. As the club size expands, the terms of trade are progressively shifted in favor of the insiders. This leads to an expansion of RIA membership if outsiders are interested.

Next, insiders have the option of rejecting new memberships. This is the "Our Market is Large Enough" syndrome which comes from the observation that large entities have tended to opt for inward-looking trade and investment strategies while small ones have gone to the outward-looking route (Bhagwati, 1993). In general, importers in a

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[1] WTO-style multilateral trade liberalization, in comparison, requires larger "coincidence of wants", hence more complicated negotiations, than RIA. This is probably one of the reasons why some authors claim that Regionalism is easier than Multilateral.

member country will be against new entry because this is associated with increased competition in the domestic market; that is, the enlargement of an RIA leads to a "thinning" of the preferential markets. "Member firms will gain from the cost advantage that they enjoy vis-à-vis the nonmember firms and hence will have an interest in not admitting the nonmembers to the RIA" (Bhagwati and Panagariya, 1996). Finally, the insiders can drop out of the club in order to join another club or to act unilaterally.

At the other end of the table, the outsiders, first, can always opt for the status quo and not apply for membership in any regional grouping. In some instances, countries feel that they are better off acting unilaterally rather that joining a regional grouping (e.g., Japan or Hong Kong). Second, they can apply for membership to an existing group. The fear of trade diversion can induce outsiders to seek entry. A common reason for countries to seek membership is the improvement in market access of their firms. The larger market generated by their entry into an RIA could allow oligopolistic firms to exploit increasing returns to scale. Baldwin (1993) builds a model that shows that the incentive of outsiders to join an RIA increases as the RIA membership grows. The "cost of nonmembership" increases as other outsiders join the RIA. This will lead to an expansion of the RIA if insiders accept. Many other reasons for an outsider to apply for a RIA membership or to form a RIA are presented in Fernandez (1997) and Whalley (1996).[2]

Next, outsiders have the option of forming a new RIA with other outsiders. The formation of a RIA in one region could lead countries in another region to emulate it.

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[2] These include, in addition to the traditional arguments, the "time inconsistency", "domestic policy strengthening", "signaling", "insurance", "bargaining power" and "coordination device" arguments.

(e.g., the formation of an Asian RIA in response to NAFTA and EU).[3] Finally, as is

argued in a companion paper, trade diversion caused by the RIA could cause the

excluded countries to raise their barriers against the insiders.

In the section 3, I present a formal model that determines the equilibrium size of a

RIA. Here, I briefly discuss the structure of the model and the intuitions for its results.

Define $U(h)$ as the net-benefit or payoff that <u>an individual country</u> receives from

being a member of a RIA of size h. $U(h)$ is conjectured to be strictly concave function of

h. At low level of h, an increase in the RIA size increases the members' net-benefit (due

to camaraderie, enlarged market and bargaining power). Exporters will gain as they have

access to a larger market. At large values of h increases however, the entry of a new

member would decrease the insiders' net benefit. From the point of view of a member

country, the marginal benefits of an extra member decrease (and eventually become

negative) with the expansion of the RIA because of congestion and crowding arising with

an increasing number of members. Alternatively, as the RIA becomes large, the number

of countries on which an individual insider has cost advantage in any given market

declines so that the benefits of being a member decline. Costs may also rise more than

proportionately for organizational reasons.

An RIA is a voluntary bloc and an outsider decides whether it wants to join or not

by comparing $U(h)$ to the payoff associated with being an outsider. Define $V(h)$ as the

net-benefit of an <u>individual country</u> from remaining an outsider. A nation would apply

for membership if $U(h) > V(h)$. It is conjectured that, due to the increased bargaining and

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[3] This brings up two very important questions: Under some what circumstances would a multi-club world
emerge? Would these clubs merge so as to eventually form a super-RIA (i.e., global free trade)? These
questions are dealt with in Andriamananjara (2000).

market power of the insiders, *V(h)* is a decreasing function of *h*. This reflects the increasing "cost of nonmembership" as the size of the RIA increases. Krugman (1991) reviews two of the reasons why outsiders may be made worse off. First, there will be a shift in demand and therefore in the terms of trade away from the nonmembers, even with no increase in the level of trade barriers applied against them. Second, if each political unit sets its level of trade barriers optimally, the formation of a trading bloc may lead to a higher level of protection against the outsiders.

The two functions, *U(h)* and *V(h),* are shown in Figure 1. The form and shape of the *U(h)* and *V(h)* functions will depend on the formal model. Many factors (including institutional arrangements, each country's objective function, and structure of the productive sector) can affect the behavior of those functions. Given these factors, the task is to study the incentive structure facing both the insiders and outsiders for expanding or not the RIA.

Imagine a world with *g* identical countries. For simplicity, assume that the *g* countries move sequentially (one by one), as opposed to simultaneously. Suppose then that the first two countries agree to form an RIA. After that, these two insiders would be willing to accept new members up as long as *U(h)* increases. This occurs up to point A in Figure 1. Beyond point A, new entries will make member countries worse off and, thus, will be rejected. On the other hand, outsiders will seek membership as long as *U(h)* exceeds *V(h)*. In Figure 1, this goes on up to point B. Beyond that point, the net-benefit of being an insider becomes smaller than that of being an outsider so that the outsiders would stop applying for membership to the RIA.

Along with the incentives of the insiders and the outsiders, the rules of accession into an RIA are very likely to affect the equilibrium structure and size of an RIA. Those rules could take one of two forms. First, the insiders could adopt an *Open (Free) Membership* policy in which any outsiders wishing to enter can do so. In this case, the equilibrium RIA size will be totally up to the outsiders. The size of the RIA would go up to B since outsiders will enter as long as being a member makes them better off than being a nonmember. Second, the insiders could choose a *Selective Membership* policy in that they have the option of whether or not to accept new members. In this case, the equilibrium RIA size will be totally up to the insiders and the resulting size will be A. We now move to the formal models.

3. The General Equilibrium Model

The model presented in this section is a variant of the Krugman intra-industry trade model. There are *g* symmetric countries in the world, *h* of which are members of the regional trade bloc. There is one differentiated-products sector which is characterized by increasing returns and imperfect competition. This is an attractive aspect of the model since in the real world, the role of increasing returns to scale seems to be very important and the new trade theory, with increasing returns and monopolistic competition, seems to grasp the reality of trade in manufactured goods fairly well. Technology and preferences over goods are identical in all countries.

The Demand Side

The social utility function in country *k* is assumed to have the CES form:

$$(1) \qquad U_k = [\sum_{i=1}^{N} C_{ik}^{(s-1)/s}]^{s/(s-1)}, \quad s > 1,$$

where N is the number of varieties of the differentiated good available to the consumer,

C_{ik} is the consumption of the i-th differentiated good in country k and, s is the elasticity

of substitution between any two varieties. Some of the differentiated good are produced

domestically while others are imported. Utility is maximized subject to the budget

constraint, $\sum_{i=1}^{N} P_{ik} C_{ik} = Y_k$ where P_{ik} is the domestic (tariff-ridden) price i-th differentiated

good in country k, and Y_k is the national income of country k. Utility maximization in

country k yields country's demand function for typical variety i which is given by:

$$(2) \qquad C_{ik} = (\frac{P_{ik}}{P_k})^{-s} Y_k, \quad P_k = [\sum_{j=1}^{N} (P_{jk})^{1-s}]^{-1/s}.$$

P_k can be thought of as an index of country k' price level.

The Supply Side

On the supply side, the labor input requirement for a typical manufactured variety is:

$$(3) \qquad l_i = a + bx_i, \quad a, b > 0,$$

where x_i is the output of variety i, a is a fixed cost necessary for any positive amount of

production and, b denotes the labor input requirement per unit of output. The total cost

incurred by the producer of the i-th variety in country k is therefore:

$$(4) \qquad TC_{ik} = a.W_k + b.W_k.(\sum_{j=1}^{g} C_{ij}),$$

where W_k is the wage rate in country k. Due to the fixed cost, the production technology

exhibits increasing returns to scale. The cost of introducing a new variety is zero, so

there will be only one firm producing each variety.

A typical manufacturer, who faces an iso-elastic demand curve, maximizes the sum of its operating profit across all countries. A firm from country k maximizes the following profit function:

(5) $$\Pi_k = \sum_{j=1}^{g} \frac{P_{kj} C_{kj}}{1 + t_j^k} - a.W_k - b.W_k.\sum_{j=1}^{g} C_{kj} ,$$

where t_j^i is the tariff rate that country j imposes on imports from country i ($t_j^i = 0$ if $i = j$). As is common in the literature, it is assumed that there is a large number of varieties so that a firm considers s to be the elasticity of demand that it faces (Helpman and Krugman, 1985, pp. 118-9). The first order condition for producers in country k is given by:

(6) $$P_{kj}.(1 - \frac{1}{s}) = b.W_k.(1 + t_j^k) , \text{ for sales in country } j.$$

We assume "free-entry" and "free exit" so that in equilibrium all the profits of each existing firm are driven away by potential entrant ($\Pi_k = 0$). One implication of the constant elasticity of demand is that the scale of production and the average cost is not affected by the existence of trade. The amount of production, x, of any variety as well as the number of varieties produced in each country, n, become invariant. In this model, it can be computed by using the free-entry/zero-profit condition that:

(7) $$x_k = \sum_{j=1}^{g} C_{kj} = \frac{a.(s-1)}{b} , \text{ for any country } k \text{ and}$$

(8) $$n_k = \frac{L_k}{a.s} ,$$

where L_k is the total labor supply ($L = l.n$). It is henceforth assumed that the amount of production and the number of varieties are the same across countries (so that $N = g.n$). In the remainder of this paper, we will assume for simplification that for all countries

$$L = 1, x = 1, \text{ and } n = 1 \text{ (i.e., } \boldsymbol{b} = (\boldsymbol{s} - 1) / \boldsymbol{s}, \boldsymbol{a} = 1 / \boldsymbol{s} \text{)}.$$

Thus, the total number of varieties of the differentiated good equal the total number of countries $N = g$.

Tariff Revenue and National Income

The tariff revenue collected by the government is distributed in a lump-sum way to domestic consumers. The national income therefore consists of the value of total production plus the tariff revenue:

$$(9) \qquad Y_k = \sum_{j=1}^{g} \frac{P_{kj} C_{kj}}{1 + t_j^k} + \sum_{j=1}^{g} \frac{t_k^j}{1 + t_k^j} P_{jk} C_{jk} .$$

Finally, we have the trade balance condition (i.e., total expenditure on k's good must equal to total expenditure by k) :

$$(10) \qquad \sum_{j=1}^{g} \frac{P_{kj} C_{kj}}{1 + t_j^k} = \sum_{j=1}^{g} \frac{P_{jk} C_{jk}}{1 + t_k^j} .$$

This completes the formal model. Note that the welfare of a representative country can be expressed by the indirect utility function:

$$(11) \qquad V_k = P_k^{(\frac{-\boldsymbol{s}}{\boldsymbol{s}-1})} Y_k \equiv [\sum_{i=1}^{g} P_{ik}^{(1-\boldsymbol{s})}]^{1/(\boldsymbol{s}-1)} Y_k .$$

4. Modeling Regional Integration

We can now turn to the issue of regional integration. In this model, there are two types of countries: *h insiders* and *g-h outsiders*. In terms of the tariff notation, $t_j^i = 0$ if $i = j$ or i and j are both insiders of the same regional arrangement; $t_j^i = t > 0$ otherwise. It is assumed that the levels of *external* tariffs remain the same before and after the formation of a RIA. An interpretation of this is that the RIA adheres to GATT's Article XXIV. Before going further, it is helpful to introduce the following short-hand notations (by taking advantage of the symmetry of the problem) in order not to abuse notations:

C_{inin}:   Consumption in an *insider* of a good produced in an *insider*.

C_{outin}:   Consumption in an *insider* of a good produced in an *outsider*.

C_{outout}: Consumption in an *outsider* of a good produced in an *outsider*.

C_{inout}:   Consumption in an *outsider* of a good produced in an *insider*.

$C_{outself}$: Consumption in an *outsider* of a good produced domestically.

The notations for the domestic (tariff-inclusive) prices are written analogously, so that P_{outin}, for example, denotes the price in an *insider* of a good produced in an *outsider*. Y_{in} and Y_{out} respectively denote an *insider* and an *outsider*'s national income. Analogous notations apply to the wage rate W_{in} and W_{out}.

From the utility maximization, we write the consumption demand functions as:

(12)
$$C_{inin} = (\frac{P_{inin}}{P_{in}})^{-s} Y_{in}, \quad C_{inout} = (\frac{P_{inout}}{P_{out}})^{-s} Y_{out},$$
$$C_{outin} = (\frac{P_{outin}}{P_{in}})^{-s} Y_{in}, \quad C_{outout} = (\frac{P_{outout}}{P_{out}})^{-s} Y_{out},,$$
$$C_{outself} = (\frac{P_{outself}}{P_{out}})^{-s} Y_{out}$$

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where:

$$P_{in} = [h.P_{inin}^{1-s} + (g-h).P_{outin}^{1-s}]^{\frac{-1}{s}},$$

$$P_{out} = [P_{outself}^{1-s} + h.P_{inout}^{1-s} + (g-h-1).P_{outout}^{1-s}]^{\frac{-1}{s}}.$$

P_{in} and P_{out} can be viewed as indicators of the consumer price level in respectively the insiders and the outsiders. From the profit maximization of each firm (see (6)), we can write the domestic (consumer) prices of the differentiated product as:

(13)
$$P_{inin} = W_{in}, \quad P_{inout} = W_{in}(1+t),$$
$$P_{outin} = P_{outout} = (1+t), \quad \text{and } P_{outself} = 1.$$

W_{out} is normalized to unity. From (7), the *zero-profit conditions* yield the following:

(14)
$$(x_{in}) \quad h.C_{inin} + (g-h).C_{inout} = 1, \text{ and}$$
$$(x_{out}) \quad C_{outself} + h.C_{outin} + (g-h-1).C_{outout} = 1.$$

The *National Income (or total expenditure) equations* (see (9)) in each type of country are respectively expressed as:

$$Y_{in} = h.P_{inin}C_{inin} + (g-h)\frac{P_{inout}}{(1+t)}C_{inout} + \frac{t}{1+t}(g-h).P_{outin}C_{outin},$$

(15)
$$Y_{out} = P_{outself}C_{outself} + h\frac{P_{outin}}{(1+t)}C_{outin} + (g-h-1)\frac{P_{outout}}{(1+t)}C_{ouout}$$

$$+ \frac{t}{1+t}h.P_{inout}C_{inout} + \frac{t}{1+t}(g-h-1).P_{outout}C_{outout}.$$

The *Trade Balance equation* for both types can be simplified to get:

(16)
$$P_{inout}C_{inout} = P_{outin}C_{outin}.$$

We also write each type of country's indirect utility function as respectively:

(17)
$$V_{in} = P_{in}^{(\frac{-s}{s-1})}Y_{in}, \text{ and}$$
$$V_{out} = P_{out}^{(\frac{-s}{s-1})}Y_{out}.$$

Using the prices and demand functions from the profit and utility maximization, the objective is solve the National Income and the Zero Profit equations (the Trade Balance equation being redundant by Walras's law) for Y_{in}, Y_{out}, and W_{in}. After substitution of variables and some manipulations, we end up with a system of three equations with three unknown:

(18)
$$\begin{cases} Y_{out} = \dfrac{P_{in}^s}{P_{out}^s} W_{in}^{s-1} Y_{in}, \\[2mm] W_{in}^s = h.P_{in}^s Y_{in} + (g-h)(1-t)^{-s} P_{out}^s Y_{out}, \\[2mm] 1 = h.(1+t)^{-s} P_{in}^s Y_{in} + [1 + (g-h-1)(1-t)^{-s}] P_{out}^s Y_{out}, \end{cases}$$

which is, for convenience, reduced into a 2x2 system in Y_{in} and W_{in}:

(19)
$$\begin{cases} Y_{in} = \dfrac{(h.W_{in}^{1-s} + (g-h)(1+t)^{1-s})}{(h.W_{in}^{1-s} + (g-h)(1+t)^{-s})}.W_{in}, \\[4mm] Y_{in} = \dfrac{(h.W_{in}^{1-s} + (g-h)(1+t)^{1-s})}{(h.(1+t)^{-s} W_{in}^{1-s} + 1 + (g-h-1)(1+t)^{-s})}.W_{in}^{1-s}. \end{cases}$$

5. Effects of an RIA

Effects on Insider's Wage Rate

We are now able to determine the effects of the formation or the expansion of a RIA by using the 2x2 system in (19). By eliminating Y_{in}, we obtain the implicit relationship between the membership size (h) and the wage rate in an insider country (W_{in}):

(20) $\qquad h[W_{in}^s + (1+t)^s W_{in}^{1-s} - W_{in} - 1] = W_{in}^s[(g-1) + (1+t)^s] - g$.

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For future use, we can establish using (20) that as h increases from 1 to g, W_{in} monotonically increases from 1 to less than $(1 + t)$:

(21) $\qquad 1 < W_{in} < (1+t)$ for $1 < h < g$.

This implies that the highest price of any variety of the differentiated good is lower that $(1 + t)$. From the definition of National Income (Y_{in}), and the normalization of the size of production (x) and the number of good (n) to unity, we can infer two other useful facts are:

(22) $\qquad 1 < Y_{in} < (1+t)$ for $1 < h < g$, and

(23) $\qquad 1 < Y_{out} < (1+t)$ for $1 < h < g$.

Taking total derivatives of both sides of (20) with respect to h and W_{in} and rearranging, we can write the effect of an increase in h on W_{in} in terms of "hat calculus":

(24) $\qquad \hat{W}_{in} = [h.\dfrac{W_{in}^{-1}(W_{in}^{s} - 1) + W_{in}^{-s}((1+t)^{s} - W_{in}^{s})}{s[(g - h - 1) + (1+t)^{s}]W_{in}^{s-1} + (s-1)(1+t)^{s}hW_{in}^{-s} + h}].\hat{h}$,

where a "hat" (^) over a variable denotes the proportionate change in it. For example,

$\hat{h} = \dfrac{dh}{h}$ denotes the "proportionate" or "percentage" change in the RIA size[4]. Evidently,

$\hat{h} > 0$ means that the club is expanding. Both the denominator and the numerator in the expression between the square brackets in (24) are positive, ergo $\dfrac{dW_{in}}{dh} > 0$. Bearing in mind that we set the outsider's wage rate to unity, we can therefore conclude that the creation or the expansion of an RIA always increases the insiders' wage rate as well as

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[4] For convenience, h is treated as a continuous variable, where $h \in [1, g]$. Note that treating h as a discrete variable does not alter the main results of the analysis.

the price of their exports (P_{inin} and P_{inout}). Another interpretation of this is that an

increase in the RIA size unambiguously improves the insiders' terms of trade.

Effects on Outsider's National Income

After some manipulations and substitutions of the above equilibrium conditions (starting

with equation (16)), we can write:

(25)
$$\hat{Y}_{out} = \frac{h.(Y_{out} - (1+t))(1 - W_{in}^{1-s})}{Y_{out}[(1+t)^s + h.W_{in}^{1-s} + (g - h - 1)]}\hat{h} + \frac{h.(Y_{out} - (1+t))(s - 1)W_{in}^{1-s}}{Y_{out}[(1+t)^s + h.W_{in}^{1-s} + (g - h - 1)]}\hat{W}_{in} ,$$

Recalling that σ is larger than one and that Y_{out} is less than $(1 + t)$, it can easily be

seen that the coefficients of $\hat{W}_{in}$ and $\hat{h}$ are both negative. Hence, $\hat{Y}_{out}$ is a negative

function of $\hat{W}_{in}$ and $\hat{h}$. Since we already know from (24) that a rise in h will lead to an

increase in W_{in}, this implies that an expansion in the group size will unambiguously

decrease the outsiders' national income, or $\dfrac{dY_{out}}{dh} < 0$.

Effects on Outsider's Welfare

Given the above result on the outsiders' income, we can compute the effect of an

expansion in the RIA size on the outsiders' welfare. Using (17), we derive:

(26)
$$\hat{V}_{out} = -\frac{s}{s-1}\hat{P}_{out} + \hat{Y}_{out} ,$$

where, $\hat{P}_{out} = \dfrac{h}{s} P_{out}^s (1+t)^{1-s}[(s - 1)W_{in}^{1-s}\hat{W}_{in} + (1 - W_{in}^{1-s}).\hat{h}]$.

Note that $\hat{P}_{out}$ is a positive function of both $\hat{W}_{in}$ and $\hat{h}$. This implies that a rise in h

(which leads to an increase in W_{in} and a decrease in Y_{out}) will increase P_{out} and ultimately

decrease V_{out} (i.e., $\dfrac{dV_{out}}{dh} < 0$). In words, the creation and the further expansion of an RIA

unambiguously decrease the welfare of those countries that are left out of the

arrangement even if the insiders strictly adhere to GATT's Article XXIV by not raising

the level of their external tariffs. This suggests that the current provision of the WTO

regarding RIAs is not sufficient to protect outsiders and that Article XXIV should be

altered in a way that insiders must <u>decrease</u> their external MFN tariffs.

Effects on Insider's National Income

With regard to the insiders, the results are not as clear-cut. The creation or the expansion

of a RIA does not necessarily improve the insiders' welfare. After manipulations of the

2x2 system in (19), we get the effect of a change in W_{in} and h on Y_{in} :

(27)
$$\hat{Y}_{in} = [\frac{h.((1+t)^{s} - Y_{in}) - h.W_{in}^{s-1}((1+t) - Y_{in})}{h + [(g-h-1) + (1+t)^{s}]W_{in}^{s-1}}].\hat{h}$$
$$+ [\frac{(1-s)((1+t)^{s} - Y_{in})h}{h + [(g-h-1) + (1+t)^{s}]W_{in}^{s-1}}]\hat{W}_{in}.$$

An increase in h has two effects on an insider's national income. Foremost, the

coefficient of $\hat{h}$ is positive which means that an positive change in h will directly

increase the national income. However, there is a second order impact since an increase

in h also increases W_{in} which will in turn have a negative effect on the national income

(the coefficient of $\hat{W}_{in}$ being negative).

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Effects on Insider's Welfare

Using (17):

(28) $$\hat{V}_{in} = -\frac{s}{s-1}\hat{P}_{in} + \hat{Y}_{in},$$

where, $\hat{P}_{in} = \frac{h}{s}P_{in}^{s}[(s-1)W_{in}^{1-s}\hat{W}_{in} + ((1+t)^{1-s} - W_{in}^{1-s}).\hat{h}].$

Note that $\hat{P}_{in}$ is a positive function of $\hat{W}_{in}$ but a negative function of $\hat{h}$.

Attempting to solve analytically for the direction of the change in the insiders' welfare

due to an expansion in the group size is an extremely complicated task. A numerical

simulation of the model is a more "sane" line of attack. This is undertaken in the next

section.

6. RIA Expansion and Equilibrium Size

In this section, the model is simulated using some specific parameter values. Four

representative cases are presented in Figure 2 for illustrative purpose[5]. The figures show

both the outsider and the insiders' welfare as a function of the RIA size. As in Baldwin

(1993), the countries are identical except for their degree of domestic "resistance to

membership". Denote R_k country k's domestic (non-economic) resistance to being a

member of the RIA. The countries are arranged in order of increasing resistance: $R_k <$

R_{k+1}.[6] Formally, country k will only want to be part of the trading bloc if:

(29) V_{in} - $V_{out} > R_k$,

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[5] In general, the results presented in this section are robust to changes in the parameters of the model.

[6] This implies that, ceteris paribus, if country k has no incentive in being a member, then neither would country $k + 1$.

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that is, if the gain from being a member can offset the country's resistance. V_{in}-V_{out} could be thought of as the domestic pressure for membership. At the initial (status quo) equilibrium, we assume that all R_k ($k = 1$ to g) are high enough so that none of countries are opting for the formation of a group. We then introduce an idiosyncratic shock to the system (e.g., exogenous decreases in R_1 and R_2) so that the first two countries decide to create an RIA between themselves. How would this shock affect the equilibrium?

Outsiders' Incentives or Demand for Membership

Note first that the simulation results in Figure 2 confirm the finding of the previous section that the outsiders' welfare declines as a result of an expansion of an RIA. It can also be verified that $V_{in} > V_{out}$ (for any h between 1 and g) which means that for any given group size, it is always more attractive to be an insider than to be an outsider if R_k is zero or negative. It is also established that the difference between the two welfare values (V_{in} - V_{out}) is increasing as the group size increases.

These results imply that after the exogenous formation of an RIA between countries 1 and 2, the incentives and the domestic pressures for country 3 (and all other remaining outsiders) to join in increase since they have more to gain from doing so. Country 3 will apply for membership if the pressures to join become large enough so as to offset the resistance to membership. If country 3 becomes a member, the domestic pressures in country 4 increases and so on. We can see that countries that were not initially interested in being part to the RIA may after the shock become interested. This domino effect will go on until the group size reaches a point where the increase in the domestic pressure in a country can no longer offset the domestic resistance to membership.

This is illustrated in Figure 3, where V_{in} - V_{out} and R_k are plotted against h. At point 1, V_{in} - V_{out} < R_k : even the country with the lowest resistance has no incentive to form an RIA. Suppose that the exogenous shock first brings us to point A. At that point, R_k becomes smaller than V_{in} - V_{out} so that the next country has now an incentive to join. As this next country enters the RIA, the domestic pressure in the remaining countries increases. If membership was free or open, the domino effect will take place all the way to point B. The equilibrium membership size B, in this case, decreases (increases) as the difference between the g countries, in terms of resistance to membership, increases (decreases). Evidently, if the slope the R_k line is not too steep, meaning that the countries are not too different, all the countries in the world would become members of the RIA.

Insiders' Incentives or Supply of Membership

Going back to Figure 2, it can be seen that the insiders' welfare is a concave function of the group size: The welfare of the insiders (V_{in}) initially increases with the enlargement of a RIA, but when the group size reaches about one half of the world (around 15-17 out of 30), V_{in} begins to decline with any further expansion of the RIA. Insiders would accept new members only if the expansion increases their welfare (up to the point that maximizes their welfare). An implication of this is that in the case of selective membership, the equilibrium group size will be less that the total number of countries in the world. Baldwin's dominoes do not tumble all the way to the last one and worldwide free trade fails to appear.

Effects on World Welfare

Since we already know the welfare of both the insiders and the outsiders for any given club size, it is straightforward to get an indication regarding the impact of the creation or the expansion of an RIA on the world welfare. We write:

(30) $$V_{world} = h.V_{in} + (g - h).V_{out}$$

As before, this quantity is computed using different parameter values. Four representative cases are presented in Figure 3. The general shape of the V_{world} curve is robust to changes in the parameters of the model. The figures tells us first of all that global free trade ($h = g$) always dominates any other trading structure. Moreover, the world welfare (V_{world}) is a convex function of the RIA size: at small level of h, it initially decreases with the enlargement of a RIA, but when the group size reaches a bit less than one half of the world (around 10-14 out of 30), the world welfare begins to rise with any further expansion of the RIA. Hence, in this model, the world welfare is minimized just before the group size reaches about half of the total number of countries in the world.

One implication of this analysis is that if membership is open and if the countries are similar in terms of their resistance, we could attain worldwide free trade and the world welfare could be at its maximum level. If the countries are very different in terms of their resistance to membership, worldwide free trade will fail to appear even if membership was open. In fact, at some point, outsiders may no longer seek membership. On the other hand, if membership were selective, the equilibrium RIA size would be about half of the world, which could be close to the point where the world welfare is minimized. It is very possible that the equilibrium size is the world-welfare minimizing one.

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This analysis also implies that regionalism will take place in waves. Every so often, there is an idiosyncratic shock to the system. The shock triggers a Baldwin-type domino effect. Regionalism will expand and spread quickly during this period. The effect will come to a halt when it reaches high enough resistance in some countries and the fever for regionalism dies down. Then, another shock will take place that triggers another wave of regionalism, and so on. This is definitely a story that can be seen in the real world.

7. Concluding Remarks

This paper presents an analytical model of RIA formation in a differentiated good/monopolistic competition framework. I find, on the one hand, that an expansion of a regional grouping always unambiguously hurt those that are left out even if the external tariffs of the RIA remain constant as Article XXIV of the GATT stipulates. On the other hand, the effects of a club expansion on an insider's welfare is positive for small club size but becomes negative as the club becomes large. This is consistent with the "club theory" characteristics of and RIA in that congestion and crowding tend to occur as the number of members increases.

With the help of some simple simulations, I show that (i) global free trade is the welfare maximizing RIA size in terms of world welfare and that (ii) world welfare is minimized when the RIA contains about half of the countries in the world. I also find that the expansion of a RIA fails to lead to global free trade in the case where membership is selective. In fact, at some point, the dominoes fail to tumble: the insiders will refuse to admit new members as the congestion characteristics of the club start to

kick in. RIAs are <u>stumbling blocks</u> under "selective-entry" regionalism. To add insult to injury, the insiders would start rejecting new members when the group size is around half of the world, which could be very close to the size that minimizes world welfare.

Under "open membership", the equilibrium group size is totally determined by incentives facing the outsiders. The model shows that the dominoes could tumble all the way to the last one as long as the countries are not too different in terms of resistance to membership. As in Baldwin (1993)'s story, the expansion of a RIA increases the incentive of the outsiders to join the club. The interesting part of this is that outsider countries that initially had no interest in integration become interested as the number of insiders increases. Therefore, the club size could grow until it contains all the existing countries. World welfare would reach its maximum level in this case. This supports the arguments that under open regionalism, RIAs are <u>building blocks</u> towards global free trade. This type of result has lead some economists (e.g., Yi (1996b) and Snape (1992)) to recommends the addition of a clause to Article XXIV specifying that FTAs must let in any country that wants to join. Requiring such a liberal accession clause in free trade area and customs union agreements would ensure that these clubs within the GATT club would further, rather than threaten, the aims of GATT itself.[7]

One has, however, to reckon that having a truly "open membership" in practice is not as easy as it is in theory. Srinivasan (1996) argues that "Open Regionalism is nothing but an oxymoron" as it is available to only those outsiders who are willing to meet whatever conditions (e.g., reciprocity) are attached to it. In the same spirit, Lawrence

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[7] The Council of Economic Advisers (CEA) and the Eminent Persons Group (EPG) as well as Mr. Renato Ruggeiro, the Director-General of WTO, also have embraced this kind of "open regionalism" which consists of plurilateral agreements that are nonexclusive and open to new members to join (Srinivasan, 1996).

(1996, pp. 102-3) argues, "it is hard to imagine how GATT could force agreements when partners were not willing to do so, and not hard to imagine members defining conditions for access that inhibit outsiders from seeking to join."

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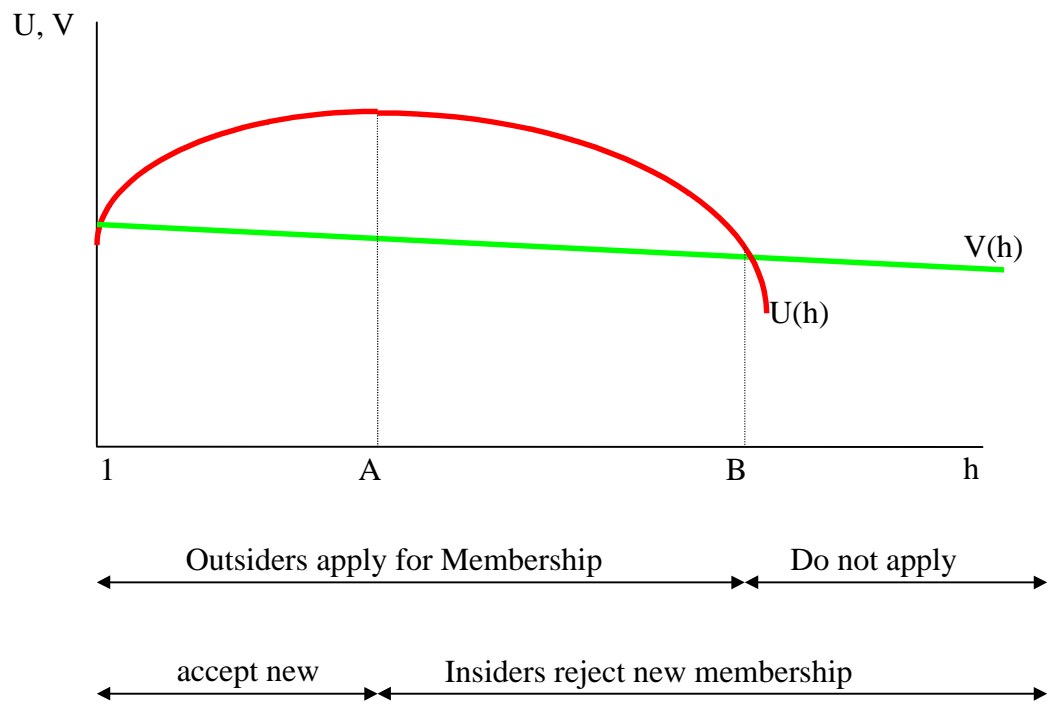Figure 1: Determination of the Size of an FTA
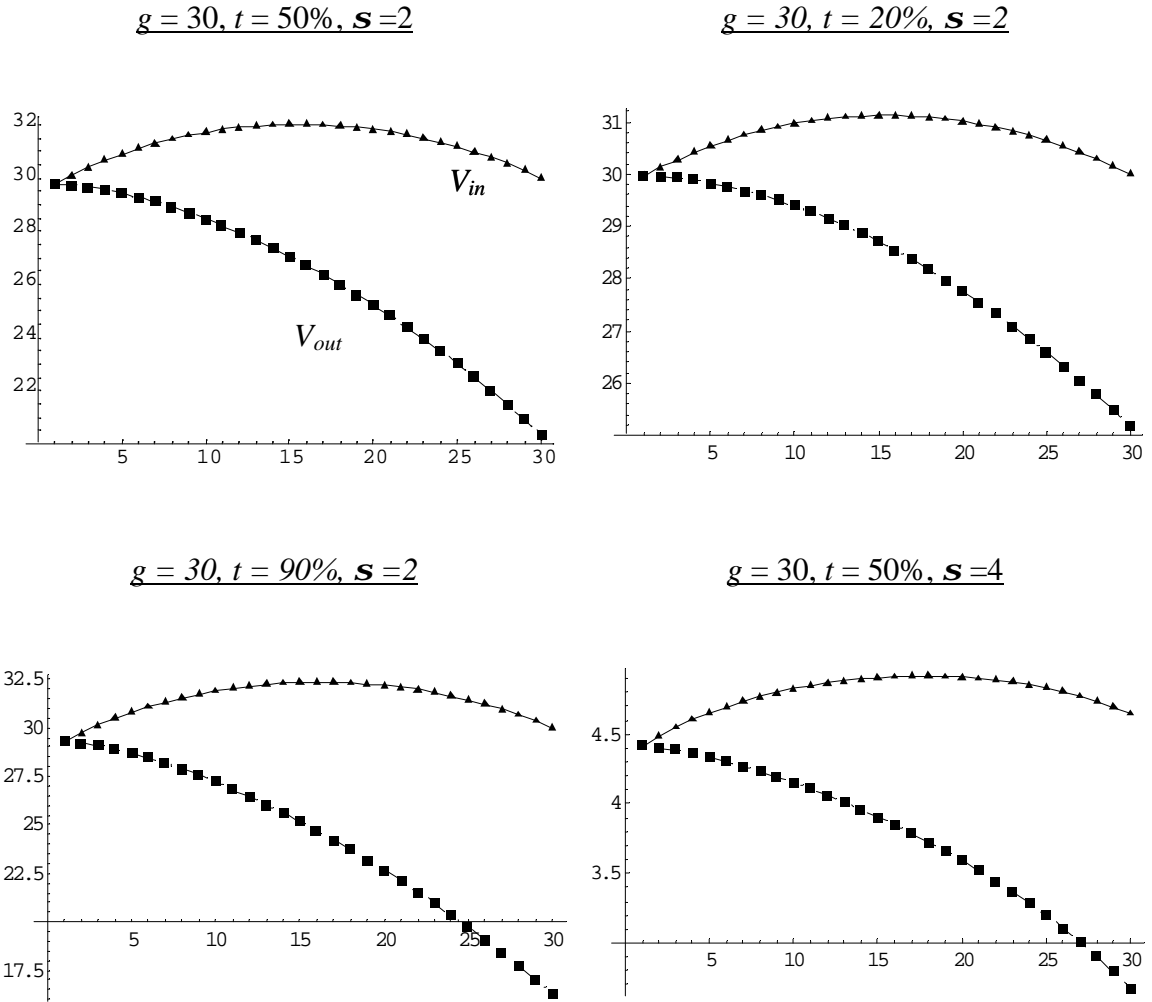
Figure 2: RIA Size and Welfare

$g = 30, t = 50\%, s = 2$

V_{in}

V_{out}

$g = 30, t = 20\%, s = 2$

$g = 30, t = 90\%, s = 2$
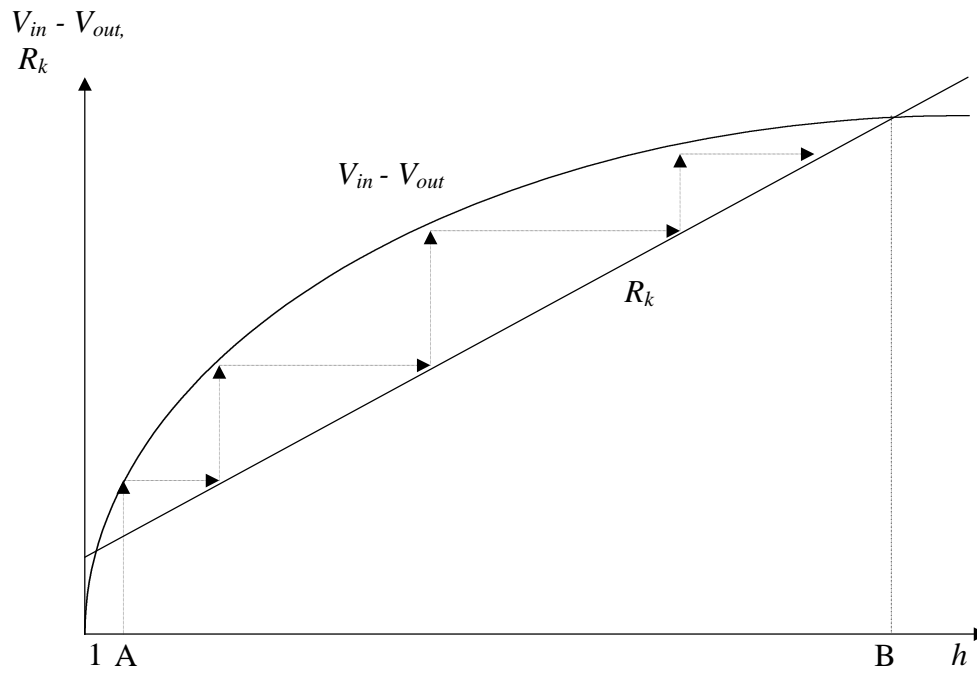

$g = 30, t = 50\%, s = 4$

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Figure 3: RIA Expansion and Domino Effect

Figure 4: RIA Size and World Welfare

$g = 30, t = 50\%, s = 2$

$$V_{world} = h\, V_{in} + (g-h)\, V_{out}$$

$g = 30, t = 20\%, s = 2$

$g = 30, t = 90\%, s = 2$

$g = 30, t = 50\%, s = 4$